

The missing chemo port catheter fragment

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Abstract

The totally implantable venous access ports (TIVAP) is commonly indicated for oncology patients for administration of chemotherapy, total parenteral nutrition and long-term intravenous therapy. It is associated with some complications, which might cause significant morbidity or mortality. Spontaneous fracture and migration of the catheter is a rare but potentially serious complication. We presented a 22 year-old gentleman with diffuse large B cell lymphoma and had TIVAP done. It was complicated with the fractured and embolized catheter fragment. Endovascular retrieval was successfully performed and patient was subsequently discharged well.

Keywords: Totally Implantable Venous Access Ports; Embolized Catheter Fragment; Snaring; Endovascular Retrieval

1. Introduction

A totally implantable venous access port (TIVAP), also known as chemoport, is commonly implanted in oncology patients for long term administration of chemotherapeutic agents, prolonged intravenous therapy and parenteral feeding. Its usage has been increasing over the years. It is usually implanted at the subclavian vein, the jugular vein, brachiocephalic vein or the superior vena cava. The increasing usage is associated with increased risk of complications. Common complications are infection, occlusion or venous thrombosis. Fracture and embolization of the catheter fragment is a serious complication. We presented a rare case of embolized catheter fragment and described its predisposing factors, possible complications, endovascular retrieval and its successful outcome.

2. Case presentation

A 22 year-old gentleman was diagnosed with diffuse large B cell lymphoma stage 3 and chemoport catheter was implanted at right brachiocephalic vein for long term chemotherapy administration. Subsequently he had completed six cycles of chemotherapy and was clinically well. During his routine follow up, leaking at the chemoport insertion site and difficulties in flushing the chemoport catheter were detected. Otherwise, he was asymptomatic. No fever or pain over the insertion site. No prior history of trauma or vigorous sports activity. Urgent chest X-ray revealed fracture of the chemoport catheter (Figure 1). Further evaluation with urgent computed tomography pulmonary angiogram showed a fractured distal tip, embolized to the third-degree branch of the left pulmonary artery (Figure 2). Otherwise, the affected arterial branch was not dilated and patent. He was referred to cardiology team for urgent percutaneous endovascular retrieval of the fractured catheter fragment after multi-disciplinary team discussion. It was done in supine position with continuous electrocardiogram and hemodynamic monitoring. Removal was done under fluoroscopic guidance as the fragment was a radio-opaque object. The right femoral vein was catheterized, a 8-Fr sheath and 7-Fr JR 3.0 guiding catheter were placed. Control wire V-18 0.018 inch x 200cm was directed into left pulmonary artery, subsequently exchanged with guidewire Asahi Sion 0.014 inch x 190cm, advanced beyond the catheter fragment and maneuvered to surround the catheter. Snaring was done with Merit Medical One Snare 4-Fr 0.082 inch x 120cm. It was able to capture

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and remove the fractured catheter fragment (Figure 3). The puncture site was manually compressed until haemostasis secured. No immediate complications. He was adequately heparinized throughout the procedure. Post procedural chest X-ray was unremarkable. Patient was discharged well on the next day.

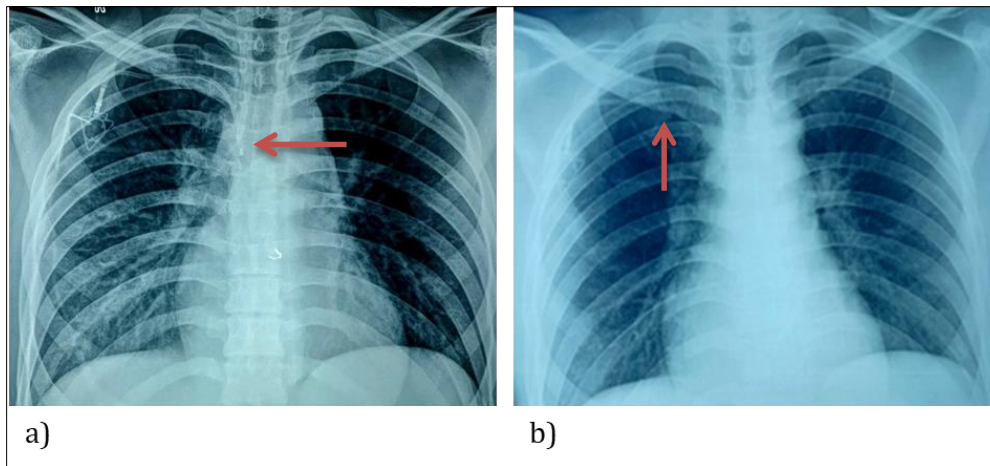


Figure 1 a) Chest radiography showed a totally implantable venous access port (TIVAP) after the surgical implantation. Arrow indicates a complete TIVAP. b) Chest radiography shows a fractured distal tip of the catheter. Arrow indicates the fractured distal tip of the catheter

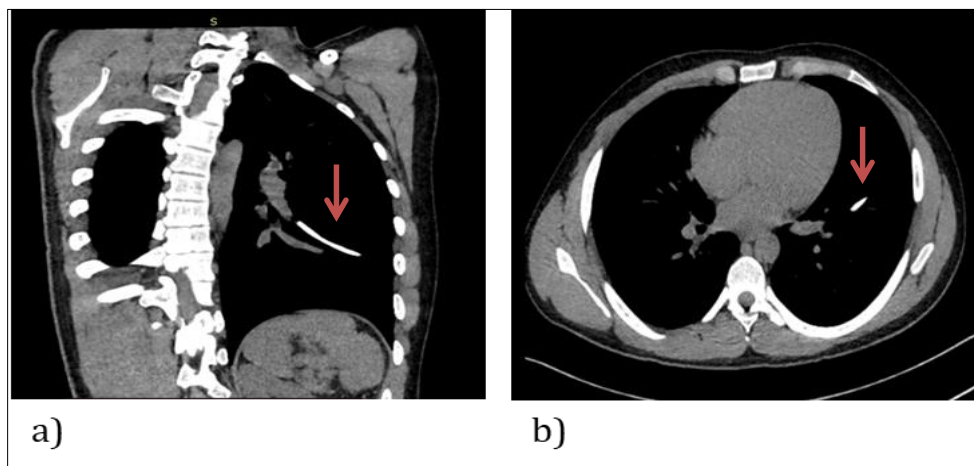


Figure 2 Arrows showed the location of the migrated catheter fragment in sagittal plane (a) and axial plane (b) in computed tomography

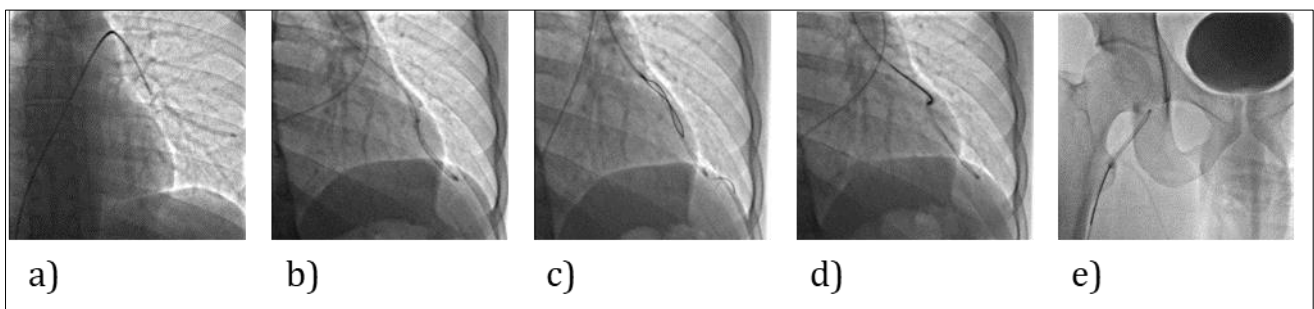


Figure 3 (a): guiding catheter was approaching the fractured catheter fragment, (b): guidewire was advanced beyond the catheter fragment, (c): snaring was performed, (d): successfully captured, (e): captured catheter fragment was retracted and removed

3. Discussion

Spontaneous catheter fracture and embolization are a relatively rare but serious complication, as it might occludes the pulmonary circulation, leading to arrhythmias or pulmonary thromboembolism, and subsequently pulmonary hypertension or right ventricular failure. Catheter embolization was first described in 1954 [1]. The estimated incidence is 0.2% to 2.9% [2]. The usual sites of embolization are superior vena cava (15.4%), right atrium (27.6%), right ventricle (22%), and pulmonary arteries (35%) [3]. Possible causative factors are type of port implanted, placement site, chemotherapy type, and usage duration. The most typical site of spontaneous catheter fracture is the space between the clavicle and the first rib, due to the greatest mechanical friction against the catheter at this point [4]. Study showed that the different material used for catheter has different rupture rates. Compared to polyurethane catheters, silicone catheters have higher resistance and this resulted in lower incidence of rupture [5]. More than 50 % of the patients had no symptoms, and was detected incidentally during the planned chemoport removal [6]. They might also present with symptoms such as pain or swelling over the implantation site, paraesthesia in the arm, palpitation or resistance to infusion. Migration of the catheter fragment is a serious complication. The migrated fragment can travel to the right atrium, ventricle, internal jugular vein or pulmonary vessel. This might cause myocardial or vessels perforation, internal jugular vein thrombosis, and pulmonary artery pseudoaneurysm [4]. Regular chest X-ray monitoring is useful for early detection. Pinch-off sign is the earliest radiographic indication of impending catheter fracture. It is important to remove the embolized catheter fragment with appropriate tools and expertise timely by either percutaneous endovascular retrieval or surgical intervention. Early detection and the advancement in endovascular retrieval techniques provide an opportunity to prevent further complications and avoid open thoracotomy. The available options of endovascular retrieval are loop snare, balloon catheter, basket retriever, and grasping forceps. The standard recommended method is the loop snare, which has higher success rate and lower complications [7]. One of the most common associated complications is arrhythmia, which is usually transient and self-limiting. Other possible complications are tricuspid valve injury, myocardial perforation or tamponade. Gentle and careful manipulations of the guidewire and catheter can reduce the risks [8].

4. Conclusion

Our intention of presenting this inadvertently fractured and embolized catheter fragment and its management is to emphasize the importance of early detection by routine chest radiography monitoring, high index of suspicion, risks and complications awareness, timely intervention and effective multi-disciplinary team communication.

Compliance with ethical standards

Acknowledgments

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Disclosure of conflict of interest

The authors declare no conflicts of interest.

Statement of informed consent

Informed consent was obtained.

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